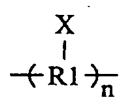
CLAIMS

1. A proton conductor, including:

a compound having a structural part expressed as Chemical formula 1; and

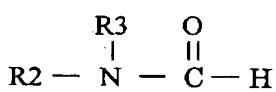
a compound having a structure expressed as Chemical formula 2.

(Chemical formula 1)



where R1 represents a component including carbon (C), X represents a protoic dissociation group, and n is in the range of $n \geqq 1$.

(Chemical formula 2)



where R2 and R3 represent a component including carbon or hydrogen (H), respectively.

2. A proton conductor according to claim 1, wherein the compound having the structure expressed as Chemical formula 2 includes at least one of N, N-dimethyl formamide and N-methyl formamide.

3. A proton conductor according to claim 1, wherein where the number of moles of the compound having the structural part expressed as Chemical formula 1 is a, and the number of moles of the compound having the

structure expressed as Chemical formula 2 is b, a ratio of the number of moles b of the compound having the structure expressed as Chemical formula 2 to the number of moles of the protic dissociation group ($a \times n$) is in the range of $10 \leqq b/(a \times n) \leqq 30$.

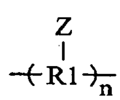
4. A proton conductor according to claim 1, wherein the protic dissociation group is at least one of a $-SO_3H$ group, a $-COOH$ group, and a $-OH$ group.

5. A single ion conductor, including:

a compound having a structural part expressed as Chemical formula 3; and

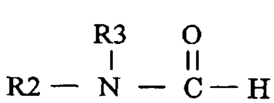
a compound having a structure expressed as Chemical formula 4.

(Chemical formula 3)



where R1 represents a component including carbon (C), Z represents a cationic dissociation group, and n is in the range of $n \geqq 1$.

(Chemical formula 4)



where R2 and R3 represent a component including carbon or hydrogen (H), respectively.

6. A single ion conductor according to claim 5, wherein the compound having the structure expressed as Chemical formula 4 includes at least one of N, N-dimethyl formamide and N-methyl formamide.

7. A single ion conductor according to claim 5, wherein where the number of moles of the compound having the structural part expressed as Chemical formula 3 is c, and the number of moles of the compound having the structure expressed as Chemical formula 4 is b, a ratio of the number of moles b of the compound having the structure expressed as Chemical formula 4 to the number of moles of the cationic dissociation group ($c \times n$) is in the range of $10 \leqq b/(c \times n) \leqq 30$.

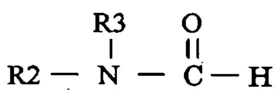
8. A single ion conductor according to claim 5, wherein the cationic dissociation group is at least one of a $-SO_3M$ group, a $-COOM$ group, and a $-OM$ group where M represents lithium (Li), sodium (Na), potassium (K), or rubidium (Rb).

9. A method of manufacturing a proton conductor, including the step of impregnating a compound having a structural part expressed as Chemical formula 5 into a compound having a structure expressed as Chemical formula 6, or into a solution obtained by dissolving the compound having the structure expressed as Chemical formula 6 in a solvent.

(Chemical formula 5)

where R1 represents a component including carbon (C), X represents a protic dissociation group, and n is in the range of n≧1.

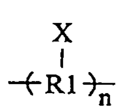
(Chemical formula 6)



where R2 and R3 represent a component including carbon or hydrogen (H), respectively.

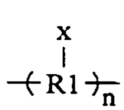
10. A method of manufacturing a proton conductor, including the step of mixing a compound having a structural part expressed as Chemical formula 7 or Chemical formula 8 and a compound having a structure expressed as Chemical formula 9 in a solvent and evaporating the solvent.

(Chemical formula 7)



where R1 represents a component including carbon (C), X represents a protic dissociation group, and n is in the range of n≧1.

(Chemical formula 8)



where R1 represents a component including carbon, x represents a group capable of becoming a protic dissociation group by ion exchange, and n is in the range of $n \geqq 1$.

(Chemical formula 9)

$$\begin{array}{ccccc} & & R3 & & O \\ & & | & & \| \\ R2 & - & N & - & C - H \end{array}$$

where R2 and R3 represent a component including carbon or hydrogen (H), respectively.

11. A method of manufacturing a single ion conductor, including the step of impregnating a compound having a structural part expressed as Chemical formula 10 into a compound having a structure expressed as Chemical formula 11, or into a solution obtained by dissolving the compound having the structure expressed as Chemical formula 11 in a solvent.

(Chemical formula 10)

$$\begin{array}{c} Z \\ | \\ -\!\!\left(R1 \right)_{n} \end{array}$$

where R1 represents a component including carbon (C), Z represents a cationic dissociation group, and n is in the range of $n \geqq 1$.

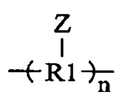
(Chemical formula 11)

$$\begin{array}{ccccc} & & R3 & & O \\ & & | & & \| \\ R2 & - & N & - & C - H \end{array}$$

where R2 and R3 represent a component including carbon or hydrogen (H), respectively.

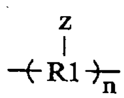
12. A method of manufacturing a single ion conductor, including the step of mixing a compound having a structural part expressed as Chemical formula 12 or Chemical formula 13 and a compound having a structure expressed as Chemical formula 14 in a solvent and evaporating the solvent.

(Chemical formula 12)



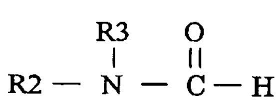
where R1 represents a component including carbon (C), Z represents a cationic dissociation group, and n is in the range of n≧1.

(Chemical formula 13)



where R1 represents a component including carbon, z represents a group capable of becoming a cationic dissociation group by ion exchange, and n is in the range of n≧1.

(Chemical formula 14)

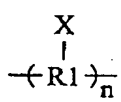


where R2 and R3 represent a component including carbon or hydrogen (H),

respectively.

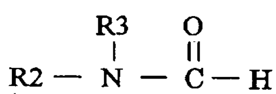
13. An electrochemical capacitor having a capacitance between a pair of electrodes opposed with an electrolyte inbetween, wherein the electrolyte includes a compound having a structural part expressed as Chemical formula 15 and a compound having a structure expressed as Chemical formula 16.

(Chemical formula 15)



where R1 represents a component including carbon (C), X represents a protic dissociation group, and n is in the range of $n \geqq 1$.

(Chemical formula 16)



where R2 and R3 represent a component including carbon or hydrogen (H), respectively.

14. An electrochemical capacitor according to claim 13, wherein the compound having the structure expressed as Chemical formula 16 includes at least one of N, N-dimethyl formamide and N-methyl formamide.

15. An electrochemical capacitor according to claim 13, wherein where

the number of moles of the compound having the structural part expressed as Chemical formula 15 is a, and the number of moles of the compound having the structure expressed as Chemical formula 16 is b, a ratio of the number of moles b of the compound having the structure expressed as Chemical formula 16 to the number of moles of the protic dissociation group ($a \times n$) is in the range of $10 \leqq b/(a \times n) \leqq 30$.

16. An electrochemical capacitor according to claim 13, wherein the protic dissociation group is at least one of a $-SO_3H$ group, a -COOH group, and a -OH group.

17. An electrochemical capacitor according to claim 13, having a pseudo capacity expressed as a derived function $d(\Delta q)/d(\Delta v)$ between magnitude of electrical charge (Δq) and magnitude of electrical change (Δv), in addition to the capacitance between the pair of electrodes.